New substd. furyl, thienyl or pyrrolyl carbonyl-guanidine derivs. - used e.g. as cellular sodium proton exchange inhibitors, antiarrhythmic agents and cell proliferation inhibitors

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Abstract (Basic): EP 676395 A

Heteroaryl-guanidine derivs. of formula (I) and their salts are new. A = S(O)m, O or NR5; m = 0, 1 or 2; R5 = H, 1-8C alkyl or CmH2mR81; R81 = 3-8C cycloalkyl, phenyl (opt. substd. by 1-3 of F, Cl, CF3, Me, OMe, and NR82R83) or 1-9C heteroaryl (bonded via C or N and opt. substd. by 1-3 of F, Cl, CF3, Me, OMe, OH, NH2, NHMe and NMe2); R82, R83 = H or Me; one of R1, R2 = CO-N=C(NH2)2; the other = H, F, Cl, Br, I, 1-3C alkyl, OR6, 1-4C perfluoroalkyl, CO-N=C(NH2)2 or NR6R7; R6,R7 = H or 1-3C alkyl; R3, R4 = (i) H, F, Cl, Br, I, CN, X(CH2)m(1-6C) perfluoroalkyl, X(CH2)mF, S(O)mR8, CONR9R10, COR11, SO2NR12R13; (ii) 1-8C alkyl, CmH2mR81; (iii) 1-9C heteroaryl (opt. substd. by 1-3 of F, Cl, CF3, Me, OMe, OH, NH2, NHMe and NMe2); (iv) -Y-C6H4-(CO)i-(CHOH)j-(CHOH)k-R23; (v) H, F, Cl, Br, I, CN, 1-8C alkyl, 1-8C perfluoralkyl, 3-8C alkenyl, CgH2g-R26; SR29, OR30, NR31R32, CR33R34R35; (vii) -W-C6H4-R97; (viii) S(O)mR37, SO2NR38R39; (ix) X1R46; (x) SR64, OR65, NHR66, NR67R68, CHRR69R70, CR54R55-OH, Ctriple bondC-R56 C(R58) C-R57 (sic), (CR59R60)u-CO-(CR61R62)v-R63; (xi) SO2NHR76; or (xii)NR84R85; X = O, S or NR14; R14 = H or 1-3C alkyl; R8 = 1-5C alkyl, 3-6C alkenyl, CnH2nR15 or CF3; R9, R11, R12 = H or as R8; n = 0-4; R15 = 3-7C cycloalkyl or phenyl (opt. substd. by 1-3 of F, Cl, CF3, Me, OMe and NR16R17); R16,R17 = H or 1-4C alkyl; R10, R13 = H or 1-4C alkyl; or R9+R10 or R12+R13 = (CH2)4 or (CH2)5 in which one CH2 may be replaced by O, S, NH, NMe or N-benzyl; R18 = 3-8C cycloalkyl or phenyl (opt. substd. by 1-3 of F, Cl, CF3, Me, OMe and NR19R20); R19,R20 = H or Me; Y = O, S or NR22; h = 0 or 1; i, j, k = 0-4; provided that h, i and k are not all 0; R22,R23 = H or 1-3C alkyl; g = 0-4; R26 = 3-8C cycloalkyl, phenyl, biphenyl, or naphthyl (where aromatics are opt. substd. by 1-3 of F, Cl, CF3, Me, OMe and NR27R28); R27,R28 = H, 1-4C alkyl or 1-4C perfluoroalkyl; R29-R31, R33 = -(CH2)m-(1-9C) heteroaryl (opt. substd. as in R81); R32, R34 , R35 = H, 1-4C alkyl, 1-4C perfluoroalkyl, or as R29; R96 = heteroaryl as defined for R81, or benzyl; W = O, S or NR36; R36 = H or 1-4C alkyl; R37 = 1-8C alkyl, 1-8C perfluoroalkyl, 3-8C alkenyl or -CsH2s-R40; s = 0-4; R40 = as R26; R38 = H, 1-8C alkyl, 1-8C perfluoroalkyl, 3-8C alkenyl or

-CwH2w-R26; R39 = H, 1-4C alkyl or 1-4C perfluoroalkyl; or R38+R39 = (CH2)4 or (CH2)5, in which one CH2 may be replaced by O, S, NH, NMe or N-benzyl; X1 = O, S, NR47, (D=O)A'- or NR48C=MN*(R49)-; M = O or S; A' = O or NR50; D = C or SO; R46, R49 = 1-8C alkyl, 3-8C alkenyl, -(CH2)b-(1-7C)perfluoroalkyl or -CxH2x-R26; b = 0 or 1; x = 0-4; R47, R48, R50 = H, 1-4C alkyl or 1-4C perfluoroalkyl; or R46+R47 or R46+R48 = (CH2)4 or (CH2)5 in which CH2 may be replaced by O, S, NH, NMe or N-benzyl; A' and N* are bonded to the phenyl ring of the benzoylguanidine structure; R64-R67, R69 = -(CH2)y-(CHOH)z-(CH2)q'-(CH2OH)t-R71 or -(CH2)b'-O-(CH2CH2O)c'-R72; R71, R72 = H or Me; b', c' are not defined; u, t = 1-4; v, y, z, a' = 0-4; R68, R70, R54, R55 = H or 1-6C alkyl; or CR69R70 or CR54R55 = 3-8C cycloalkylidene; R63 = H, 1-6C alkyl, 3-8C cycloalkyl or -CeH2e-R73; e = 0-4; R80 = 5-7C cycloalkyl or phenyl (opt. substd. by 1-3 of F, Cl, CF3, OMe and 1-4C alkyl); or R77+R78 = (CH2)4 or (CH2)5, in which one CH2 may be replaced by O, S, NH, NMe or N-benzyl; R79 = as R77; or amidino; R84, R85 = H or 1-4C alkyl; or R84+R85 = (CH2)4 or (CH2)5 in which one CH2 may be replaced by O, S, NH, NMe or N-benzyl or 1 or 2 CH2 gps. may be replaced by CH-Cd'H2d'+1; d' is not defined. Cpds. (I; A = O; R1 = -CON=C(NH2)2; R2, R3 = H; R4 = H, Me or Et) are excluded.

USE - (I) are used for treatment of arrhythmia or shock states; for treatment or prophylaxis of cardiac infarct, angina pectoris, cardiac ischaemia, ischaemic states of the peripheral and central nervous system, stroke or ischaemic states of the peripheral organs and limbs; and adjuvant during surgical operations and organ transplants; in preservation and storage of transplants; for treatment of diseases in which cell proliferation is a prim. or sec. cause, esp. atherosclerosis, complications following diabetes, cancer, fibrotic diseases, (e.g. fibrosis of the lungs, liver or kidneys) or prostatic hyperplasia; and as reagents for inhibiting Na+/H+ exchange and for diagnosis of hypertension and proliferative diseases (all claimed). More generally (I) inhibit the cellular Na+/H+ exchange mechanism and cell proliferation and are useful for combatting oxygen deficiency states, pathological hypoxia and ischaemia. They are esp. useful as antiarrhythmic agents.

Daily dose is 0.001-10 (pref. 0.01-1) mg orally, parenterally, rectally or by inhalation.

ADVANTAGE - (I) have good antiarrhythmic activity, without undesirable salidiuretic side effects, potent cellular Na+/H+ exchange inhibiting activity and good water solubility (facilitating i.v. admin.).

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Segment: CPI